

Monitoring Study Group Meeting Minutes

October 16, 2003

Howard Forest—CDF Mendocino Unit Headquarters Training Center

The following people attended the MSG meeting: Tharon O'Dell (BOF-chair), John Munn (CDF), Tom Spittler (CGS), Will Stockard (UC Berkeley), Jared Gerstein (UC Berkeley), Marc Jameson (CDF-JDSF), Tim Robards (CDF), Kathleen Morgan (Gualala River Watershed Council), Dr. Richard Harris (UC Berkeley), Joe Croteau (DFG), Dr. Cajun James (SPI), Dr. Marty Berbach (DFG), Angela Wilson (CVRWQCB), Kirk O'Dwyer (Campbell Timberland Management), Stephen Levesque (Campbell Timberland Management), Elias Steinbuck (Mendocino Redwood Co.), Bonnie Burchill (Environmental Resource Solutions), Ron Pape (CDF), Leslie Markham (CDF), Matthew House (Simpson Resource Co.), Richard Gienger (HWC/SSRC), Dr. Kate Sullivan (PALCO), Henry Alden (Gualala Redwoods Co.), Dr. Bill Weaver (Pacific Watershed Associates), and Pete Cafferata (CDF). **[Note: action items are shown in bold print].**

We began the meeting with general monitoring related announcements:

- Cajun James announced that the "Spatial and Temporal Variability in Forest Water Quality Monitoring, Research and Regulations" workshop she is developing will be held on December 1st and 2nd in Redding at the Holiday Inn. Speakers include Drs. MacDonald, Benda, Ziemer, Reeves, Sullivan, Hannaford, James, Madej, Diller, and Hunsaker. Co-sponsors of the workshop are the UC Berkeley Forestry Center and CDF. For the final agenda and further information, send Sherry Cooper, UC Cooperative Extension an email at: shcooper@ucdavis.edu.
- Pete Cafferata announced that the one-day workshop in Arcata on appropriate turbidity data collection techniques to answer specified study questions and turbidity data processing techniques that is being developed by Dr. Mary Ann Madej and Randy Klein will now be scheduled for after the first of the year.
- Richard Harris announced that Jim Harrington's annual bioassessment conference will be held on December 1st and 2nd in Sacramento. He also stated that there will be a workshop on effectiveness and validation monitoring of restoration projects during the 22nd Annual Salmonid Restoration Conference to be held from March 17 to 20, 2004 in Davis. Contact Richard for more information (rrharris@nature.berkeley.edu), or see the Salmonid Restoration Federation website: <http://www.northcoastweb.com/srf/conference.html>.
- Richard Gienger stated that there will be a workshop on the Canoe Creek Fire, an old-growth redwood fire that occurred in Humboldt Redwoods State Park this summer, on November 1st in Redway. For more information, contact Yana Valachovic at yvala@ucdavis.edu.
- Pete Cafferata and Tom Spittler stated that they observed the Canoe Creek Fire on October 15th. Patrick Vaughan, CDPR, informed them that his department is actively trying to get researchers involved in documenting the fire's impacts, including possibly installing five continuous recording turbidimeters with assistance from the USFS-PSW and Dr. Tom Lisle.

Following these announcements, Pete Cafferata provided the group with an update on progress made on the three ongoing MSG cooperative instream effectiveness monitoring projects. The South Fork Wages Creek project received detailed peer review from Dr. Robert Ziemer and Jack Lewis, USFS-PSW. A meeting was held on October 7th at Howard Forest with Dr. Ziemer, Graham Matthews, Stephen Levesque, John Munn, and Pete Cafferata to revise the study plan based on peer review comments. The study objectives and study hypotheses were rewritten during this session. Additionally, it was agreed that a fifth continuous sampling station would be added. **A revised study plan is anticipated near the first of November. Field sampling equipment is being installed during the month of October.** The SPI instream monitoring project is no longer considering Coffee Creek in Trinity County, since it was decided that a basin within the jurisdiction of the CVRWQCB is desirable. Cajun James is working with Angela Wilson of the CVRWQCB to locate a suitable study watershed. Possible sites are located near Viola and Castle Crags State Park. **Final site selection is anticipated by the end of October and a study plan will be written.** This study will have an above/below study design, rather than a control/treatment design. Finally, the new Garcia River instream cooperative study has approved contracts with the Mendocino County RCD from both CDF and NCRWQCB in place and Teri Jo Barber, working for the MCRCD, is actively purchasing field equipment for five continuously recording turbidity stations. Mendocino Redwood Company, Pioneer Resources, and Larry Maillard have agreed to allow stations to be installed on stream locations within their timberlands. **Pete Cafferata will post the study plan from the contract with the NCRWQCB on the MSG website under Archived Documents.**

The next agenda item was a discussion of the Draft MSG Instream Monitoring Projects Goals and Objectives document developed earlier this year. Pete Cafferata introduced the topic by providing the history of the document. At the February 11, 2003 MSG meeting, it was agreed that a clear goal statement for MSG sponsored cooperative projects was needed so that everyone has similar expectations regarding what these projects can and cannot accomplish. Mark Rentz, CFA, and Pete Cafferata developed a draft version in March which was refined in April. The MSG had not considered that draft until the discussion at the present meeting. Pete stated that comments about appropriate peer review for the South Fork Wages Creek instream project make the discussion of this document timely and important, and then briefly summarized the document's main goal statement and individual bullet points. The main goal, as currently stated, is: "MSG instream monitoring projects shall be designed to determine if the FPRs, when properly implemented, minimize negative impacts to water quality." Individual bullets include the concepts of designing projects to monitor the effectiveness of the FPRs, having adequate peer review, ensuring appropriate study design, requesting data to document costs associated with the work, and reporting results to the BOF and other agencies.

Following this introduction, there was considerable discussion regarding possible additions to improve the document. Marty Berbach suggested it may be better to refer to "short-term" effectiveness of the FPRs, since it will be likely that very major storm events may not have occurred to test the rules during the life of an instream monitoring project. Cajun James and Tom Spittler agreed that it would be beneficial to specify that rainfall and/or stream flow recurrence intervals will be tracked during instream monitoring projects to determine the magnitude of stressing storm events encountered during the project. Marc Jameson and Richard Gienger suggested broadening the

scale of the instream projects to document impacts from activities other than just timber operations. Stephen Levesque suggested that it is critical to develop instream projects that document biological impacts—not just physical impacts. Richard Gienger suggested adding language that would encourage the development of partnerships with watershed groups. Will Stockard and Cajun James suggested that stable, long-term sources of funding should be an objective of this document. Kate Sullivan said the multi-stakeholder groups were useful in receiving funds for monitoring work in Washington, and that it may be possible to obtain EPA non-point pollution grants. Cajun James stated that USFS county grants may also be possible, particularly for mixed ownership watersheds. Kate also suggested “forestry cooperatives” as a possible model for long-term funding (e.g., stand management cooperative, genetic cooperative). **Tharon O’Dell directed Pete Cafferata to set up a sub-committee to explore possible grants that could be secured for long-term funding of instream projects. Pete Cafferata stated he would revise the draft MSG Instream Monitoring Projects—Goals and Objectives documents to reflect the suggestions from the group.**

Kate Sullivan, PALCO Senior Scientist, provided a PowerPoint presentation titled “Water Quality Grab Sampling to Find Sediment Sources during Winter Forest Operations.” The intent of this sampling was to identify sediment sources and it was initiated partly to comply with Waste Discharge Requirements, which specified that sediment source areas be investigated. Sampling took place in both THP units and above/below road crossings after approximately one inch of rain had fallen in 24 hours. Kate stated that PALCO was encouraged to complete visual inspection of field sites, but she concluded that this was not good science, since even very experienced laboratory personnel could not adequately determine the magnitude of changes in turbidity with ocular estimates alone. She wanted a procedure that was repeatable (i.e., would allow field personnel to locate sediment source areas more than once). Since visible observations of turbidity are not adequate for replicate sampling, Dr. Sullivan developed a sampling procedure based on quantified turbidity levels. This procedure is denoted as PALCO Standard Operating Procedure (SOP) Watercourse Inspection, Ver. 2.0.

First, Kate reported the results of effectiveness monitoring for road runoff. Over 400 above and below grab samples were taken for 121 crossings associated with gravel surfaced roads on over 25 miles of road during the winter of 2002/2003. In Freshwater Creek, 57 crossings were observed, and 64 crossings were sampled in the Elk River watershed. Most of the crossings were sampled 10 times during the winter period. Kate used a threshold of greater than 20% above background to identify a significant difference for this work (downstream value compared to upstream value). Some crossings had lower turbidity values below the crossing compared to the values above the crossing during one sample period, but had high turbidities below for other storm periods sampled. It was common to have greatly elevated downstream turbidity for one sample period, while the other samples were approximately the same above and below the crossing. In other words, sediment input was not the same for all the measured storm events, but the causes for these differences were not evident. For example, during December 16th, the third day of a very large storm event, only 2 of 11 crossings in the Elk River watershed had greatly elevated turbidity levels downstream of the crossing compared to upstream values. In contrast, on March 13th, 7 out of 17 crossings had turbidity values greater than 20% over background (i.e., above crossing

value). In summary, for crossings: 1) many crossings were always within 20%, 2) some were chronically high, 3) some occasionally exceeded the 20% standard, and 4) some were repaired during the season and never were noted as being a problem again. Overall for the approximately 400 samples, 83% were <20% above background, 8% were 21-80% above background, and 9% were >80% above background.

Next, Kate explained the sediment source investigation work she has conducted associated with PALCO THPs. She stated that this approach is considerably different from hillslope monitoring, where one looks for erosion sites and determines if sediment reached a stream (top down approach). With this quantified forensic procedure, one travels up watercourses and if turbid water is observed, locates the source area on the hillslope (bottom up approach). Sometimes the sources are big and turbidity traces are very evident, but often they are much smaller. Kate stressed that it is not expensive to have field personnel collect small water samples to determine turbidity—the expensive part is getting people to the field site. She found that forestry technicians were better at collecting the water samples than PALCO Science staff personnel, largely because they were familiar with the field sites. The sampling procedure calls for the field technician to sample turbidity at the base of tributaries where they enter the mainstem, as they walk their way up the main channel. At every “link” or junction with a Class I, II, or III watercourse, the technician walks up the tributary and samples turbidity in the tributary where it enters the THP unit, or at other links. Kate characterized this field work as “horrible” due to difficulty of traversing these channels under winter weather conditions, with a single unit completed by a technician in one day. Operationally it was hard to use the 1 inch of rainfall in 24 hours criteria for sending personnel to the field, so ultimately it worked better just to send people when significant rainfall was occurring.

Last winter (2002/2003), approximately 650 samples were obtained from 14 THPs with 50 logging units (units were from 15 to 30 acres and had been clearcut). This included 548 post-harvest samples and 101 pre-harvest samples. To determine sediment sources, pairs of points were compared for turbidity (percent change was calculated by dividing downstream point value by unstream point value). Kate noted that there was high natural variability from point to point, and that it was very difficult to find sediment source areas if the change in turbidity was less than 50%. Data from control streams exhibited the same pattern.

Examples of THP observations included: 1) not much change in turbidity in a unit, 2) a decrease in turbidity downstream, 3) general increase in turbidity as stream size increases, 4) not much change in turbidity following logging, 5) transient local increases, and 6) sources found in units every time (often mapped landslides). Overall, out of a total of 417 sample pairs, 16 sediment sources were found—2 from current management and 14 from legacy roads and skid trails, bank erosion, and landslides. In addition, 85% of the sample pairs had less than a 20% increase in turbidity (and were denoted as normal), 10% had a minor turbidity increase (<40% difference), 4% had a significant turbidity increase (>40% difference)—and the source was found, and 1% had a significant turbidity increase—with no source found. With the exception of the 2 harvest unit turbidity sources, results were similar between controls and winter harvested units. The control units (82 pairs) had 83% normal, 16% had minor turbidity increases, and 1% had a significant turbidity increase.

Kate offered the following conclusions: 1) the grab sampling program could detect sediment sources; 2) major turbidity increases averaged 300% above background, sometimes were observed during sampling, and nearly always had a detectable source area; and 3) minor turbidity increases averaged 40% above background, often could not be found upon re-inspection, and were within what appears to be the variability within the sample pool. Kate stated that PALCO hopes to repeat this very intense sampling program again in the coming winter. She also stressed that this type of approach can provide abundant information on spatial variability, while continuous recording turbidity stations provide information on temporal variability. **Kate is willing to share her sampling protocol with others (Ver. 1.0 is now available, 2.0 is still being completed).**

Following lunch, Pete Cafferata provided the MSG with a brief PowerPoint presentation on a recent Oregon Department of Forestry report titled "Wet Season Road Use Monitoring Project." The study was designed to help develop new Forest Practice Rules addressing wet weather hauling. The main objective was to identify factors that contribute to turbidity when roads are used during wet periods. Study sites were mainly above and below crossings, with a smaller number of sites in streams along haul routes. Data was collected in water years 2001 (a low rainfall winter), and 2002 (a normal winter). At crossings, the study found that 90% of sample pairs had a change of 20 NTUs or less. The remaining 10% of the observations ranged from a turbidity increase of 20 to 520 NTUs. The six factors identified as most important for turbidity increases at crossings were: 1) 3-day precipitation between 1.5 – 3.0 in., 2) size distribution of road surfacing material, 3) over 250 feet of ditchline draining to channel, 4) depth of surfacing material <6 inches, 5) surfacing material durability rating of less than a 17 for the Los Angeles abrasion test, and 6) traffic levels of 10 or more trucks per day. This led to recommendations for using aggregate with a minimum percentage of fines, using 6 to 10 inches of sound aggregate, reducing ditch lengths that deliver sediment to channels to less than 250 feet, and prioritizing inspections of active winter operations during the first moderate rainfalls to determine if immediate repairs are needed or ceasing of road use is necessary. The study was completed by Keith Mills, Liz Dent and Josh Robben and is available online at: http://www.odf.state.or.us/divisions/protection/forest_practices/fpmp/MiscPDF/TechRpt17.pdf.

Under the new/unfinished business agenda item, Marty Berbach announced that DFG has a new publication available titled "Atlas of the Biodiversity of California." For more information, see: <http://atlas.dfg.ca.gov/>. Pete Cafferata stated that CDF-FRAP's new 2003 Forest and Range Assessment is available (see: http://www.frap.cdf.ca.gov/assessment2003/Assessment_Summary/assessment_summary.html). Tim Robards announced that the new Learning Center located at Camp 20 on Jackson Demonstration State Forest had its opening ceremony October 14th. It will be fully operational next spring, with barracks/office space available for researchers. Contact Marc Jameson for further information. The 40th anniversary of the Caspar Creek watershed study was also celebrated on October 14th at Camp 20 on JDSF. Richard Gienger suggested that a future meeting should be dedicated to a field trip to look at crossings. **The group agreed this would be worthwhile, with a possible concept of visiting JDSF and MRC lands next Spring to be explored further.**

The next MSG meeting was scheduled for January 13th at the Howard Forest Training Center at 10:00 a.m.